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**TITLE:** Cage for frozen foods with reducer of space

**BACKGROUND OF THE INVENTION**

**Field of the invention:**

More particularly, this invention refers to a cage in which is mounted a reducer of space that is manually displaced above the frozen foods for reducing the space preserving the frozen foods, and the use of the ice bags or dry ice.

**Description of the related art:**

A search of prior art records has unveiled the following patents:

1. US 2003/0014994 A1 registered in 2002 to Smith and al.;
2. US 4,947,658 issued in 1990 to Wheeler and al.;
3. EP 0,718,212 A1 issued in 1996 to Hazley and al.;
4. US 4,407,144 issued in 1983 to Garside;
5. US 4,682,708 issued in 1987 to Pool; and
6. US 4,921,105 issued in 1990 to Culbreth.

The patents of Smith, Wheeler, Hazley, Garside, Pool and Culbreth are probably the most relevant.

In the current market the cages are known for the delivery of frozen foods,

however the existing cages have a disadvantage: since the cages are not provided with a reducer of space, that requires to cool completely the cage, and these cages are not conceived for receiving a pallet being used as a bottom for the cage.

#### **Summary of the invention:**

The present invention refers to a cage in which is mounted a reducer of space, and which includes a plurality of tubular members in which are engaged each insulating panel; a pair of legs is mounted under each tubular member being formed with a member with slide rail between which is mounted a weather strip, an which allow to engage a reinforcing sliding bar on ball receiving a pallet on which resting the frozen foods; a reinforcing bar is mounted in the center of each insulating panel for solidifying the structure of the cage; and two hinges are mounted on the side of a tubular member for connecting a frame in which is engaged an insulating panel on which is mounted a reinforcing bar for solidifying the frame of the door having a weather strip.

A plurality of horizontal bars mounted inside the cage allow to insert the reducer of space that is connected by a fastening ~~mean~~ means and fixed under an insulating panel situated at the top from the cage, and that is

manually displaced above the frozen foods for reducing the space preserving the frozen foods and the use of ice bags or dry ice, or at a desired height during the loading and the delivery of the frozen foods.

The reducer of space is formed with a frame in which is mounted a rigid sheet, a rubber foam and a vapor barrier.

**Brief description of the several views of the drawing(s):**

Having thus generally described the nature of the present invention, reference will now be made to the accompanying drawings, showing by way of illustration a preferred embodiment thereof and in which:

Figure 1 is a perspective left side view of a cage for frozen foods showing a reducer of space lowered to the height of the frozen foods resting on a pallet engaged inside the cage.

Figure 2 is a perspective left side view of the cage for frozen foods showing the reducer of space raised above the frozen foods resting on the pallet engaged inside the cage.

Figure 3 is a perspective left side view of the cage for frozen foods showing the reducer of space raised above the frozen foods, and the frozen foods resting on the pallet transported by a pallet truck outside the cage.

Figure 4 is a perspective left side view of the cage for frozen foods showing

the reducer of space raised above the frozen foods, and the frozen foods resting on the pallet transported by a pallet truck inside the cage.

Figure 5 is a left side view of the cage including the pallet on which resting the frozen foods, and which is transported by the pallet truck.

Figure 6 is a perspective right side view of the cage for frozen foods showing the reducer of space lowered and advanced in front of the cage.

Figure 7 is a top view of the cage and the door.

Figure 8a is a view showing a vapor barrier mounted to each tubular member situated at the bottom of the cage, and in raised position.

Figure 8b is a view showing the vapor barrier lowered against a pallet.

Figure 9a is a perspective view of a mechanism making turn an arm for raising the vapor barrier when the pallet is withdrawn from the cage.

Figure 9b is a perspective view of the mechanism making turn the arm for lowering the vapor barrier against the pallet.

Figure 10 is an exploded view of the cage and reducer of space.

Figure 11 is a perspective view of the reducer of space mounted inside another structure which can be installed into an existing cage for frozen foods (not shown).

Figure 12 is an exploded view of the structure and reducer of space as

shown in figure 11.

**Numerical references of the illustrated elements:**

Cage (A)

Structure (B)

Reducer of space (C)

Insulating panel (1)(2)(3)(4)(5)

Frame (6)

Tubular Member (7)(8)(11)(12)(14)(16)(25)(32)(33)

Structure (30)(31)

Legs (9)(10)

Angle Iron (13)

Weather strip (15)(18)

Reinforcing bar (17)(19)(24)

Member with slide rail (20)(22)

Horizontal bars (23)(34)

Reinforcing sliding bar on ball (21)

Fastening mean (29)

Vapor barrier (28)(35)

Rubber foam (27)(36)

Rigid sheet (26)(37)

Frame (38)(39)

Rigid plate (40)

Vapor barrier (41)

Pipe (42)

Plate (43)

Arm (44)

Holes (45)(46)

**Detailed description of the invention:**

Now referring to the drawing, and in particular to fig. 6, a reducer of space (C) according to the illustrated mode of realization preferred of the invention is intended to be used for reducing the space preserving the frozen foods and the use of the ice bags or dry ice.

Referring mainly to figs. 1 to 10, it is shown a plurality of horizontal bars (23) that are mounted inside the cage (A) for inserting a reducer of space (C) that is connected by a fastening ~~mean~~ means (29) and fixed under an insulating panel (1) situated at the top of the cage.

The reducer of space (C) is formed with a frame (38) in which is mounted a

rigid sheet (26), a rubber foam (27) and a vapor barrier (28).

The cage (A) includes the insulating panel (1) that is engaged into each tubular member (11)(12)(14)(16); an insulating panel (4) that is engaged into each tubular member (7)(12) and between each tubular member mounted of each side; a pair of legs (10) is mounted under the tubular member (7) being formed with a member with slide rail (20) in which is engaged a reinforcing sliding bar on ball (21) receiving a pallet on which resting the frozen foods as shown in phantom lines, a weather strip (15) is mounted between the tubular member (7) and the member with slide rail (20), a reinforcing bar (17) is mounted in the center of the insulating panel (4) for solidifying the structure of the cage; an insulating panel (3) that is engaged into each tubular member (16)(25) and between each tubular member mounted of each side, the tubular member (25) is formed with an angle iron (13) for receiving the reinforcing sliding bar on ball (21) when the pallet is in the cage, and which allows to solidify the front structure of the cage when the pallet is withdrawn from the cage, and a reinforcing bar (24) is mounted in the center of the insulating panel (3) for solidifying the structure of the cage; an insulating panel (2) that is engaged into each tubular member (11)(8) and between each tubular member mounted of each

side, a pair of legs (9) is mounted under the tubular member (8) being formed with a member with slide rail (22) in which is engaged the reinforcing sliding bar on ball (21) receiving the pallet, a weather strip (15) is mounted between the tubular member (8) and the member with slide rail (22), a reinforcing bar (17) is mounted in the center of the insulating panel (2) for solidifying the structure of the cage, two hinges are mounted on the side of a tubular member in which is engaged the insulating panel (2) for connecting a frame (6) in which is engaged an insulating panel (5), and a reinforcing bar (19) is mounted in the center of the insulating panel (5) for solidifying the frame (6) of the a door being provided with a weather strip (18).

As illustrated in figs. 8a to 8b, it is shown a series of holes (45) formed thereon a vapor barrier (41) being fixed to a rigid plate (40) being mounted onto a pipe (42) fixed to each tubular member (7)(8) situated at the bottom of the cage.

As illustrated in figs. 9a to 9b, it is shown a mechanism including that is comprised of a swivelling spiral ~~mean~~ means and controlled by a plate (43) being fixed to each hole (46) of an arm (44) that allows to vapor barrier (41) to be lowered against a pallet, and raised when the pallet is withdrawn from



the cage.

As illustrated in figs. 11 to 12, a plurality of horizontal bars (34) are mounted inside another structure (B) being formed with two tubular members (32)(33) which are connected to each structure (30)(31), and which can be installed into an existing cage for frozen foods (not shown). The reducer of space (C) that is inserted inside the horizontal bars (34), is formed with a frame (39) in which is mounted a rigid sheet (37), a rubber foam (36) and a vapor barrier (35).

Although only a single embodiment of the present invention has been described and illustrated, the present invention is not limited to the features of this embodiment, but includes all variations and modifications within the scope of claims.

## CLAIM (S)

The embodiments of the invention for which an exclusive property or privilege is claimed, are defined as follows:

1) Claim 1 has been amended as follows:

--1. (amended) A cage (A) in which is mounted a reducer of space (C) ~~allowing to reduce the space preserving the frozen foods and the use of ice bags or dry ice~~, said cage including:

a plurality of tubular members ~~(7)(8)(11)(12)(14)(16)(25) in which are engaged for receiving~~ each insulating panel ~~(1)(2)(3)(4)~~;

wherein a lower tubular member includes an angle iron for receiving a reinforcing sliding bar on ball being engaged to two lower members with slide rail,

wherein said reinforcing sliding bar allows to solidify the front structure of the cage when the pallet is withdrawn from the cage;

~~a pair of legs (9) mounted under a tubular member (8) being formed with a member with slide rail (22) between which is mounted a weather strip (15), and which said member with slide rail (22) allows to engage a reinforcing sliding bar on ball (21) receiving a pallet on which resting the frozen foods; a pair of legs (10) mounted under a tubular member (7) being formed with a~~

~~member with slide rail (20) between which is mounted a weather strip (15),~~  
~~and which said member with slide rail (20) allows to engage a reinforcing~~  
~~sliding bar on ball (21) receiving a pallet on which resting the frozen foods;~~  
a reinforcing bar (17) mounted in the center of each said insulating panel  
(1)(2)(4) for solidifying the structure of the cage;

~~a reinforcing bar (24) mounted in the center of the insulating panel (3) for~~  
~~solidifying the structure of the cage;~~

a pair of legs mounted under each lower tubular member located in bottom  
of the cage;

~~two hinges mounted on the side of a tubular member in which is engaged~~  
~~the insulating panel (2) for connecting a frame (6) in which is engaged an~~  
~~insulating panel (5), and on which is mounted a reinforcing bar (19) for~~  
~~solidifying the frame (6) of the door being provided with a weather strip~~  
~~(18);~~

an angle iron (13) mounted to said tubular member (25) allows to receive  
the reinforcing sliding bar on ball (21) being engaged to each said member  
with slide rail (20)(26) when the pallet is into the cage, and said reinforcing  
sliding bar on ball (21) allows also to solidify the front structure of the cage  
when the pallet is withdrawn from the cage;

a weather strip mounted between each said lower tubular member and member with slide rail located in bottom of the cage;

a pair of hinges mounted to a tubular member for connecting a structure in which is engaged an insulating panel;

a weather strip mounted to the structure of a door;

a series of holes (45) formed thereon a vapor barrier (41) being fixed to a rigid plate (40) being mounted onto a pipe (42) fixed to each said tubular member (7)(8) members situated located at the bottom of the cage, and

a mechanism ~~including~~ that is comprised of a swivelling spiral ~~mean~~ means and controlled by a plate (43) being fixed to each hole (46) of an arm (44) that allows to vapor barrier (41) to be lowered against a pallet, and raised when the pallet is withdrawn from the cage.--.

2) Claim 2 has been amended as follows:

--2. (amended) A cage according to claim 1, wherein the reducer of space is manually displaced between each horizontal bar (23) and above the frozen foods for reducing the space preserving the frozen foods and the use of ice bags or dry ice, and said reducer of space including:

a frame (38) in which is mounted a rigid sheet (26), a rubber foam (27) and a vapor barrier (28) ; and

a fastening mean ~~(29)~~ means fixed under said insulating panel ~~(1)~~ situated  
located at the top of the cage ~~and~~ for connecting said reducer of space ~~(C)~~  
therewith .--.

3) Claim 3 has been amended as follows:

--3. (amended) A The reducer of space according to claim 1, ~~wherein the~~  
~~reducer of space is inserted between each horizontal bar (34) mounted~~  
~~inside another structure (B) being formed with two tubular members~~  
~~(32)(33) which are connected to each structure (30)(31), and which can be~~  
~~installed into an existing cage for frozen foods, and~~  
~~said reducer of space is formed with a frame (39) in which is mounted a~~  
~~rigid sheet (37), a rubber foam (36) and a vapor barrier (35).~~ is also mounted  
inside another structure which is adapted in an existing cage for frozen  
foods.--.

4) Claim 4 has been canceled:

4. (canceled) ~~The cage according to claim 1, and in which is inserted~~  
~~said reducer of space, can be also transported with the pallet by a pallet~~  
~~truck during the delivery of the frozen foods.~~

## **ABSTRACT OF THE DISCLOSURE**

A cage in which is mounted a plurality of horizontal bars allowing to insert a reducer of space that is connected by a fastening ~~mean~~ means and fixed under an insulating panel ~~situated~~ located at the top of the cage, and that is manually displaced above the frozen foods for reducing the space preserving the frozen foods and the use of ice bags or dry ice.

The reducer of space is formed with a frame in which is mounted a rigid sheet, a rubber foam and a vapor barrier.